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ABSTRACT

The four papers in this document consider alternative programs and innovative models and techniques concerned with career change and its impact on vocational education. In the first paper, Jo Shuchat addresses the issue of what vocational education is or is not doing to accommodate the increasing interest women have for nontraditional job training, and provides practical tips for getting women into nontraditional vocational programs and keeping them. In the second paper, Thomas Scanlan describes a project on entrepreneurship education at the University of Illinois, and includes several examples of strategies that can be employed in entrepreneurship education. Michael Sugarman's paper examines the phenomenon of career change and then describes how technical education preparation programs can possibly identify potential instructors. The final paper, by Charles Ryan and Robert Drummond, presents a description and analysis of an attempt in Maine to institute a statewide computer information system for career guidance. The papers were delivered at an open-invitation conference used as a strategy to identify attempts to consider the effects that the phenomenon of career change has on vocational education. (KC)

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CAREER CHANGE:
IMPLICATIONS FOR VOCATIONAL EDUCATION*

Papers Delivered at a Conference Held
at Southern Illinois University at Edwardsville
Juen 3, 1980

Compiled and Edited

by

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CAREER CHANGE:
IMPLICATIONS FOR VOCATIONAL EDUCATION

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October, 1980

INTRODUCTION

The papers in this publication were delivered at a Conference held at Southern Illinois University, Edwardsville, Illinois on June 3, 1980. The papers selected for presentation were obtained through an open invitation to the education community. Prospective speakers were encouraged to consider alternative programs and innovative models and techniques that concerned career change and its impact on vocational education, with the accent on vocational teaching.

The Conference was sponsored as part of a Project supported by a grant from the Illinois Department of Adult, Vocational and Technical Education (grant #R-35-10-X-0434-338). The larger Project, of which the Conference was a part, was concerned with identifying individuals who might be qualified and interested in a mid-career change to vocational teaching. The sponsorship of the Conference and the invitation for papers was envisioned as a strategy to identify additional attempts to consider the effects that the phenomenon of career change has on vocational education.

Jo Shuchat's paper addresses the issue of what vocational education is or is not doing to accomodate the increasing interest women have for nontraditional job training. This paper, based on a recently completed study, identifies several barriers that prevent or discourage women from entering traditionally male dominated occupational preparation programs. Ms. Shuchat's paper is particularly interesting because women make up an increasingly large percent-

tage of mid-career changers. Ms. Shuchat is Director of the Women's Outreach Project, Technical Education Research Centers, Cambridge, Massachusetts.

A Project at the University of Illinois on entrepreneurship education was described by Thomas Scanlan. The Project has, and is continuing, to develop methods and materials for teaching entrepreneurship education. Dr. Scanlan includes several examples of strategies that can be employed in teaching entrepreneurship education. Field testing of this material is currently underway.

Michael Sugarman's paper examines the phenomenon of career change and then describes how technical education preparation programs can possibly identify potential instructors. Dr. Sugarman gives a detailed explanation of how his institution, the University of Akron, has been able to develop a close relationship between its Adult Resource Center and the Technical Teacher Education program. Several former clients of the Center have subsequently received training and obtained employment in technical teaching positions at community colleges.

The final paper by Drs. Charles Ryan and Robert Drummond, professors of education at the University of Maine, Orono, presents a description and analysis of an attempt in Maine to institute a state-wide computer information system for career guidance. The authors discovered a positive response by users of such a system. A major concern, however, is the fact that users' demand has demonstrated

the need for an increase in the computer literacy levels of teachers.

A topic like career change and its impact on vocational education is so diverse and broad-ranging in its implications that these four papers can only suggest the numerous aspects that might have been addressed. We trust that these papers will stimulate its readers as it did those who participated in the Conference.

A note of thanks goes to Ms. Judith Clark Murashige, who as Project Assistant, assumed the bulk of the responsibility for the Conference's logistics.

THE RESPONSE OF VOCATIONAL EDUCATION
TO NONTRADITIONAL JOB TRAINING FOR WOMEN

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You have most likely heard more than you ever wanted to hear about how women are getting shortchanged in the labor market. Such as: nearly half the work force is now made up of women, and they earn an average of fifty nine cents (59¢) for every dollar earned by men. Two-thirds of working women work because they need to-- they are divorced and have to support children, they are single and have no other source of support, or they are married to men whose jobs don't pay enough. You probably know that a major part of the problem is that women are concentrated in many fewer occupations than men are, leading to overcrowding in those jobs. If the supply of workers is plentiful, employers don't need to extend themselves with offers of high salaries and good career ladders. Etc., etc.

Have you heard all of this before? In that case, I'm sure you'll be glad to hear that I'm going to talk about something else today.

Instead, I'm going to talk about vocational educators. You have problems, too.

One problem might be dropping enrollments, or its near relation, lots of students around but fewer full-time ones. As more and

more people attend post-secondary school on a part-time basis, your FTE's may be decreasing. This is not a comfortable situation for you personally, nor is it comfortable for your institutions when they have to pass up new equipment or programs for want of cold cash.

Another problem might be that employers in some industries, particularly high technology but also others, are insisting that you produce more trained workers, but you don't have as many students in those programs as employers need. Some of you have seen new industry decline to locate in your areas because of a low projection of qualified labor. You are getting calls from employers asking for women graduates from traditionally male vocational programs, but you can't supply them if you don't have them. These are some of the ways you may be having a problem meeting the needs of your employer constituency.

Still another problem facing vocational educators is shared by many other groups--living up to the goals they are committed to on paper. Your state Departments of Education may be putting pressure on you to enroll more women in male-intensive vocational programs, but you are having a hard time coming up with results for your annual and five-year plans.

You know where I'm leading, don't you?

Perhaps you tried to get women into NTO programs (nontraditional occupations) before, and it didn't work. You found out that allowing women into these programs didn't lead to their enrollment.

You tried publicizing the fact that these programs are open to women (what I call the "loudspeaker" method), with little success. In some of your schools, a few women signed up for sheet metal, or electronics technology, or auto body, and most of them dropped out.

If this describes your institution, you may be perplexed at the poor results. On the other hand, maybe you're not surprised at all. You already know the reasons. Women don't sign up for nontraditional programs because they're not interested. Because they're lousy at math. Because they're not strong enough. Because they don't like to get dirty, or break their fingernails. Because they can't stand hearing rough language. Because they're too emotional to take good-natured male razzing.

Right?

My colleagues and I have been funded for two years by the Bureau of Occupational and Adult Education, U.S. Department of Education, to look into nontraditional job training for women. My firm, Technical Education Research Centers in Cambridge, Massachusetts, is the contractor; the sub-contractor is Dr. Mary Ellis, of Ellis Associates in College Park, Maryland. We have interviewed nearly 180 directors of programs for women in nontraditional job training in all fifty states. They were responsible for recruiting, training, and placing thousands of women in nontraditional jobs. We also interviewed 85 women graduates of these programs, and most of them were doing very well in their new careers.

Have you heard the old story about the educational researcher? This is the one who said, "We know it works in practice, but will it work in theory?" Well, our interviews focused on practice, not theory. We asked questions about what worked and what didn't work, about strategies and techniques, about essentials and throwaways. They told us how to attract women into nontraditional vocational programs, what to do to keep them from dropping out, and how to make placements that have a good chance of sticking. All of this information has been written up in two books that are now being field tested in six states --a handbook for planners and administrators and a guide for women considering NTO. They'll be published by the Government Printing Office in the fall of 1981.

I'd like to describe some of our major discoveries.

Let's think first about women not being interested in NTO. When you were in high school and thinking about a career, did you consider becoming a deep sea diver or a scientific-glass blower? If not, was that because you thought about the work and decided you didn't like it? Or was it because these occupations didn't seem like realistic options to you, and so you didn't bother to consider them at all?

Most women don't consider occupations such as electronics technician or aircraft mechanic because they don't seem like realistic options. Women, like all of us, have been raised to believe that certain jobs are for men and certain jobs are for women. They don't even get to the point of trying on "men's" jobs mentally, just as you

didn't try on the idea of becoming a deep sea diver. Rather than saying women aren't interested in NTO, it makes more sense to say they haven't thought about it.

Why haven't they?

It starts early. A few years ago I analyzed a new series of third and fourth grade readers to see how they presented adult's occupations. The ratio of men's occupations to women's was three to one. In one of the readers men were: shepherd, psychologist, baseball coach, actor, iceman, lifeguard, king, artist, storekeeper, pioneer, clockmaker, waiter, hunter, doctor, and oculist. Women were: teacher, ballerina, and homemaker. Since few girls can make a living as ballerinas, that leaves only teacher as a paid job.

When girls get older, they begin to read magazines. What occupational horizons are presented there and on television? Just like in the readers. Women are, by and large: helpful secretaries, carefully groomed receptionists, glamorous stewardesses, efficient waitresses. And of course, they are mothers in the kitchen and in the laundry room.

In high school, girls see guidance counselors who show them career guidance books. In the books, they get the same limited list of careers to think about. Guidance counselors are so overworked they don't have time to explore a wider range of possibilities, and besides, the idea usually doesn't occur to them. They were raised, after all, at a time when girls didn't become welders, so welding would not be something that springs to mind as a real possibility for a girl.

And then there are the vocational interest inventories that appear to lend "scientific validity" to these developments. By the 11th grade, few girls are able to say they enjoy taking apart a car engine, since they haven't done it before. (They may have fixed their broken hair dryers, but no one asked them about that.) So the tests suggest careers in clerical occupations or nursing or teaching.

What I am saying amounts to this: women don't consider NTO because nobody mentions it to them.

Once the problem is stated in this form, the solution becomes obvious: mention it! Your message needs to say that NTO is for women, and it needs to be aimed at women. NTO program directors emphasized time and again that aggressive and explicit recruitment is needed to counteract women's tendency to assume that programs for machinists and computer service technicians are for men.

The recruitment materials of the programs we contacted made their message clear. "Women: earn what you're worth! Attend a free conference on women in carpentry and electronics." "Ladies, put a hard hat in your closet! Earn \$6-10 an hour and built-in lifetime security." "There is no such thing as a man's job."

Going to where the women are means more than putting an ad in the newspaper. Distributing recruitment materials that feature women is effective at day care centers, beauty parlors, supermarkets, and shopping centers. Making presentations at PTA meetings and women's clubs and holding well-publicized informational meetings for women at your schools reinforces your message.

Through all this, you educate. You inform women about these jobs: the work that is done, the work environment, the pay, the advancement potential, the training requirements. You don't gloss over disadvantages of the work, but rather present balanced information so that women can make an informed decision about whether they're interested or not. While you're educating women about NTU, you'll be creating a ripple effect and slowly reaching others in the community, such as employers. They are an important group to reach, too.

If it has been true that math is mostly needed for careers such as engineering and carpentry, and if engineers and carpenters have historically been men, then it follows that girls don't need math. So, let's think about math, which has been called the "critical filter."

Research shows that by and large, boys and girls have the same mathematical ability and do equally well at math until junior high school. At that point, boys start to pull ahead. The result is that while half the high school students are girls, only 20% of those who take math beyond geometry are girls. What happened to the other 30%?

Evidence is growing that the 30% can be accounted for by the fact that society, represented by parents, teachers, the media, and so forth, expects different kinds of achievement from girls and boys. Math is considered a male specialty, and becomes "unfeminine." Few girls are willing to take that risk--especially at the junior high age.

A time lag problem is at work here. Teachers and parents prepare a child for the world according to what they know of it-- in other words, what the world has been, not what it will be. This is hardly an ominous conspiracy. But it does mean that girls are not encouraged to take math to prepare for careers in engineering and carpentry. Note, by the way, that I didn't say girls are "discouraged" from taking math. Simply not encouraging them usually achieves the same result.

In 1974, John Ernest, a professor of mathematics at the University of California at Santa Barbara explored this subject. After interviewing many junior and senior high school teachers and students, he came to an interesting conclusion:

The results of (the interviewers') inquiry were nearly always the same. Both boys and girls, they were told, have a fair amount of trouble doing math and most of them do not like the subject very much. The difference between them is this: boys stick with math because they feel their careers depend on it and because they have more confidence than girls in their ability to learn it.*

We've all seen what happens. Girls don't take math in school, then graduate and go to work. Their lack of math is one of the reasons why their jobs are secretary, cashier (the cash register does the math for them), receptionists, and so forth. If they discover after five or ten years that these jobs don't pay enough to live on, they also discover that many better-paying

*As reported in Sheila Tobias' book, Overcoming Math Anxiety, Houghton Mifflin Co., Boston, 1978, p. 72.

jobs require math. Believing they can't do math--because they haven't taken much of it--women don't enroll in nontraditional vocational programs.

But can this obstacle be overcome? The program directors we interviewed say YES. Since the basic assumption is that women don't have enough math and feel this is a disqualification, recruitment materials and activities need to address the issue head-on. Their message is as follows. Tell women that lack of math is not a disqualification, that special math tutoring services are available, that other women with poor math backgrounds have made it through successfully. Then follow it up with math tutoring that you don't call "remedial," since this implies they are stupid--exactly the message you want to avoid. Since women are not mathematically trained, they tend to approach problem solving intuitively. Make creative use of this by teaching them to "guess-timate" first, so they can do the computations from a basis of confidence. Similarly, specialized mathematical terminology doesn't need to be a barrier. If women don't know the word "perimeter", ask them to measure around the edge of the room. They can learn the mathematical term after they've gotten the right answer.

This does call for flexible, innovative teaching. Program directors say, however, that math teachers enjoy teaching women for precisely this reason.

So far we've thought about getting information to women about NTO and about math. There's another thing you can do to get women to think about NTO careers.

I've already talked about how and why it is that women don't visualize themselves in nontraditional occupations. The best technique you can use to help them do that, the cheapest and most powerful, is to use role models--that is, flesh-and-blood women who have actually become bricklayers and survived to tell about it. At every available opportunity--in recruitment materials, feature stories in newspapers, at informational meetings, at presentations to women's groups--wherever and whenever--show role models. Have them talk about what it's like to be a woman in a male environment, how their husbands and families feel about their new careers, how their children are responding, and especially how they themselves feel about it. Most of the single NTO women we interviewed told us about an exhilarating sense of financial independence, often for the first time in their lives. Married women spoke of how good it felt to help support their families. What was the husband's exclusive burden before is now shared. They all told us how good they felt at the end of a day when they could look at something they had created, something that would last. Women need to hear this from women who have been there. Role models are your best drawing card, since they enable women to try on NTO mentally.

Closely related to the importance of role models is the presence of other women in shops, labs, and classes. NTO is unfamiliar to women. They know less about tools and terminology than men do. Since many of the women who enter NTO tend to do so in their late twenties or early thirties, they are often older than the men in their classes and have been out of school longer. They have to catch up on background material men already know and at the same time learn new material. They may be considered a little "strange" in their choice of career. All this adds up to a large need to share these experiences with other women. The understanding and encouragement of other women, known in short as "support groups," is frequently mentioned as a critical element in successful NTO programs.

The last potential obstacle I would like to mention here is male resistance. Given the history and pressure of sex role socialization, it is hardly surprising that some men--although not all--feel awkward about, opposed to, or even threatened by NTO women. If you were introduced to a movie star who is twelve years old, would you talk to him like a child or like a movie star? It's tough to reconcile them, isn't it?

In the same way, some men have a hard time reconciling the seemingly contradictory notions of air conditioning mechanic and woman. This is understandable. But if they are not reconciled after a normal "testing" period, if men cannot get to the point

where they talk to the woman like an air conditioning mechanic rather than an out-of-place female, that's a real problem. Teasing, baiting, condescension, isolation, sexual harassment, or the opposite, overprotectiveness, are not "good-natured fun" to the person on the receiving end. If this kind of behavior is carried too far, the woman cannot learn. Naturally, she drops out.

There is no easy prescription for this kind of problem. Instructors are much of the answer. They need to make it clear to male classmates that a student is a student is a student. Obviously, they need to set the same example themselves. Many instructors have no trouble doing so, but some do. For them, formal inservice may help, or informal conversations, or merely the presence of women who are determined to learn.

The single most important thing program directors said you can do to minimize the risk of resistance from men, is to enlist unmistakable support and commitment from your institution's top management to the goal of NTO for women. In this environment, resistance to women's presence in NTO vocational programs is officially-- and in practice--discouraged.

I'd like to come to the end, not with answers, but with questions. Think about them from the women's point of view. Are there things in your school that unintentionally operate to keep women out of NTO?

*Is class scheduling flexible?

*Are short-term intensive vocational programs available?

*Do you offer child care facilities or referrals?

*What careers do your career counselors suggest to women?

*Can students spend extra time in shops or labs if they need to?

*What is your president's or director's position on NTO for women?

I started out by mentioning some of the commonly held beliefs about why women are not in NTO--they're not interested, they're lousy at math, they don't like broken fingernails, etc. As you can see, there are other interpretations. In our interviews we found out about thousands of women for whom these were not serious obstacles. They may not like broken fingernails, but they like low pay and boring jobs even less.

The key to NTO for women is not special equipment, or hiring new staff, or overhauling your management structure. The key is FOCUSING ON THE WOMEN. They don't come because they think lack of math disqualifies them? Then offer and provide special math help. They don't come because they think these jobs are not for women? Then demonstrate by the use of role models that they are. They drop out because they're not used to using their muscles? Then offer and provide physical fitness training.

Vocational education is a business, and its customers are students. If the market is changing, business-as-usual will not capture it. A little market research can tell you what products and

services this new market needs, and fortunately for you, you don't have to change your whole line. A few adjustments in the packaging, some new options, and a little quality control will encourage these customers to buy.

Entrepreneurship Education:

Education for More Than Self-Employment*

Thomas J. Scanlan
University of Illinois at Urbana - Champaign

WHO ARE ENTREPRENEURS?

We can all think of acquaintances who allow their lives to slip by. They grow up and grow old, practically drifting through the different phases of their lives. They appear to accept the conditions that surround their lives as fixed, or as molded by forces outside themselves. They exercise little or no control over the quality or the direction of their lives. In the last century, Henry Thoreau, an American philosopher, remarked that most people "lead lives of quiet desperation."

This need not be so. To a great extent, we can take control of our lives and our time. We can develop "entrepreneurial" attitudes toward the circumstances of our lives and the world around us.

Entrepreneurs are people who get a lot out of life, both for themselves and others. They tend to live their lives with purpose, energy and enthusiasm. They get things done. They may

*The Methods and Materials for Entrepreneurship Education (MME) project is being conducted by the Department of Vocational and Technical Education, University of Illinois, under funding by the Illinois State Board of Education. ENTREPRENEURSHIP EDUCATION, a three-volume instructional resource has been developed: Learning the Skills; Applying the Skills and Supplementary Readings.

be described as persons who recognize and use unique relations between society and its needs to create their own careers. A few examples will help clarify the entrepreneurial approach to one's career:

Case A. When they finished college, George and many of his classmates were offered employment as junior executives in a large organization. This type of career did not appeal to George. He wanted a life that was more personally challenging and rewarding. He decided that he would try self-employment for one year. If the venture failed, he could apply for a job in industry, suitable to his educational background. With some minimal personal savings and a moderate loan from his father, he started a small fast-food outlet in a university town. Today, eight years later, he is the president of a fast growing food service business with outlets in a number of neighboring towns.

George was willing to try a different transition from school to work. He realized that there were risks involved and the possibility of failure existed. He was willing to take responsibility for these risks, and if he failed in this venture, he knew it would not mark him as a failure for life. In this instance, George took the risk, and was successful.

Case B. Twenty years ago, Kathy graduated from the local high school. After a few years working as a secretary, she married and raised a family. As her children became young teenagers, she realized that life as a mother and homemaker would become less fulfilling. She decided to go to college and develop her interests in engineering. Four years later, she graduated from college and found a new life opening up for her. She is not yet ready to take up a full time occupation, but feels confident in

her ability to change her work status to a full time career in the world of paid work as her life circumstances change.

In thinking about her life, Kathy planned in advance for future change. Her life as mother was fulfilling and enjoyable, but she foresaw that it would come to an end as her children became young adults. Accordingly she took the necessary action to prepare herself for a second career.

Case C. Shortly after Jim arrived to study in an unfamiliar locale, he discovered that there were no opportunities to develop his leisure interests in folk music. The vast majority of his fellow students were content with synthetic music and other commercialized entertainment. Within six months of his arrival, he had developed friendships with some fellow students who had interests similar to his own. With the help of some free advertising in the university newspaper, and an offer of the use of suitable premises, he and his friends established the first folk music club in town. The weekly club meeting now offers entertainment and opportunities to develop musical skills not only to Jim and his friends, but also to a growing and strengthening club membership.

This example emphasizes that "career" need not be interpreted only in the narrow sense of a job or occupation. "Career" should be regarded as the sum of an individual's total life experience, from birth to death, achieved through the media of education, work and leisure. An entrepreneurial approach can be used to enhance all aspects of a person's life.

Case D. Young Jane's heart was in drafting and sign-making, but economic necessity forced her to accept a job with a local bottling

company. She carried out her duties with the bottling company cheerfully and efficiently, but also did a number of moonlighting jobs at sign-making, her real interest. Her reputation for sign-making grew, and after six years, the increased volume of her sign-making business led her to a decision to quit her job with the bottling company. Today, twenty years later, her sign-making business is firmly established, and Jane and her employees are proud of their products.

Although Jane was forced to take up an occupation which did not offer job satisfaction, she did not allow herself to become controlled by her economic situation. In continuing to develop her interests and reputation in sign making, she succeeded in fulfilling her long-term goal of working in the area of her choice.

The above case studies have a number of implications for entrepreneurship within the context of career change. First, the idea of entrepreneurship goes beyond the idea of self-employment. Starting and operating one's own business is an excellent example of entrepreneurship, but entrepreneurship is not limited to self-employment. Second, entrepreneurship may be considered within the context of the broader definition of "career", rather than the narrower definition denoting "occupation". For example, an entrepreneurial approach may be taken in leisure, social, family, as well as in work situation. Third, an entrepreneurial approach may be helpful in many stages of personal development. It can make changing careers more meaningful, satisfying and rewarding.

WHAT ARE ENTREPRENEURIAL SKILLS?

Analyzing the personality characteristics of entrepreneurs has been compared by Kilby (1971, p. 1) to "hunting the Heffalump-- a rather large and important animal. All who claim to have caught sight of him report that he is enormous, but they disagree on his particulars." The composite results of a number of studies on the backgrounds of successful entrepreneurs give anything but a clear-cut or decisive picture. Further, the large majority of studies of entrepreneurs have included men only. A very small proportion of business owners--probably around 5% are women. However, the few studies of self-employed women do seem to establish some patterns of characteristics.

One of the most positive indicators of successful entrepreneurship arising from the literature is the occupation of the father. Mills (1963), Carroll (1965), Gilmore (1971) and Scanlan (1979) among others found that, in their samples, from 50 to 57 percent of entrepreneurs had fathers who were self-employed. Studies of self-employed women by Demerest (1977) and Schreier (1975) yielded similar results.

While these percentages are sizable proportions, what is equally interesting is the relatively large proportion of entrepreneurs whose fathers are not self-employed. Data supplied by Collins, Unwalla and Moore (1964, p. 239) show that 45% of their sample of entrepreneurs had fathers whose employee occupations were reported and unskilled and skilled laborers (30%), clerks,

salesmen and minor executives, including foremen (8%), and others (6%). Perhaps these entrepreneurs had a role model, other than their fathers, early in life. Roberts and Wainer (1966) in their study of technical entrepreneurs found that a simple familiarity with a business environment when young may be influential in a person becoming an entrepreneur. Shapero (1977) suggested the existence of a "credible example" drawn from the nascent entrepreneur's family or other of his reference groups. The nascent entrepreneur observes business start-ups by someone "like oneself" or by someone with whom one can identify. Scanlan (1979) found that 75% of his sample had either a parent or role model who was self-employed.

The educational background of entrepreneurs appears to be another significant factor. The Collins, Unwalla and Moore study (1964) reported an educational level of high school graduate or above for 64% of their sample as compared with 90.5% of the sample used by Gilmore (1971) in his study. In spite of the discrepancies, both studies show that entrepreneurs appear to have an educational level which is higher than that for the general population. Similarly, three studies of self-employed women (Demarest, 1977, The Bottom Line, 1978, American Management Association, 1978) indicate that women business owners tend to be highly educated, many having advanced degrees, and most having at least some college.

The findings of Cooper (1971), Davis (1963), Secrest (1975) and others also tend to support the high educational level of entrepreneurs, though Gilmore recommended that additional research may be needed before one could conclude that a given educational level is necessary to be a successful entrepreneur.

The personality characteristics of entrepreneurs have been studied from a variety of perspectives and by a variety of methods. In general, the various studies describe the male entrepreneur as an individual who:

"has high need for achievement; rejects and resents authority and routine; has a strong need for independence; likes moderate risks in which his efforts can help achieve a successful outcome; does not follow fixed patterns and procedures; seeks out challenge" (Shapiro, 1971, p. 20).

The entrepreneur is seen as a highly creative and innovative person. The very act of establishing a business where none existed before is a "creative act of the highest order" (Collins, Unwalla and Moore, 1964). Entrepreneurs are excited by possibilities and opportunities and are not obsessed by fear of failure. They are achievement rather than problem oriented and actively seek out challenge. Brereton (1974) holds that success in business is associated with innovative behavior, and is demonstrated by a seeking out of new ideas, a willingness to try out new ventures, and by tending to associate with other people who have similar values. In discussing the creative qualities of the effective entrepreneur, Swayne and Tucker (1973)

identify three types of creative entrepreneurs. The associative type, who uses the creative ideas of others, needs a vehicle to fulfill his objectives and is ideally suited for highly "pre-packaged" franchise operations. A second type uses only his own creative ideas and his success is positively correlated with the extent of his independence. The third type, who can use his own and others' creative ideas is the most flexible of the three types. Scanlan (1978) found that two types of male entrepreneurs scored high on the Artistic scale of Holland's Vocational Preference Inventory. This finding also supports the conception of the entrepreneur as being creative or innovative.

Creativity or innovation then, appears to be an important element in entrepreneurship. To quote Aitken, "However defined, entrepreneurship always involves.....the idea of innovation" (1965, p. 5).

The entrepreneur exhibits a strong need for independence. When conflict arises in a work situation, some people may elect to conform, others may elect to "drop out." The entrepreneur, on the other hand, sees in the creation of his own business a practical means of securing independence from others. Collins, Unwalla and Moore support this contention when they state:

....in such a situation, he does not look for solutions within the existing framework. He goes rather, outside the framework. Since he cannot tolerate long exposure to these situations of insecurity and danger, he abruptly cuts the situation out of his life

and begins a new enterprise in which he can use his own energies to create a world more tolerable to himself. This world is his new business...(1964, p. 69).

The desire to be independent has also been found in studies of women entrepreneurs. A number of women studied by Demarest (1977) cited dissatisfaction with former jobs or a generalized distaste for working for others as one of the prime motivators for considering starting their own businesses.

In creating a "world of his own," the entrepreneur's behavior is characterized by a high level of activity, innovation and competition and little fear of failure (Brereton, 1974). The entrepreneur displays self-confidence, and a willingness to take responsibility for his actions (McClelland, 1961). What happens to him is a result of his own efforts, and "not God, fate, luck government or whatever" (Berlew, 1975, p. 43). He also shows the qualities of persistence and willingness to work long hard hours. He is sufficiently motivated "to stick it out" (Allen, 1968, p. 18).

Frequent job changes prior to self-employment could be regarded as a symptom of the entrepreneur's need for independence. This occupational behavior pattern is reported in studies by Komives (1965), and Susbauer (1969). A "job-hopping" behavior is also documented in a number of case studies presented by Lessner (1973). In many cases, this pattern becomes part of the informal education of the small business owner. The skills, experiences, and knowledge accumulated, together with personal contacts made

in the process, often help develop the worker to become an effective entrepreneur. Many successful small businessmen become "jacks-of-all-trades" (Grieco, 1975).

In discussing the achievement motive, McClelland (1961) held that the "money" or "profit motive" was not as important to entrepreneurs as was historically believed. The picture of the entrepreneur, as a person driven by the necessity of making money, was not strictly true. The profit motive may be interpreted in terms of need for achievement. In our society, where personal money income plays a highly important role as a symbol of achievement (Sutton, et al., 1956), profitability provides concrete knowledge of how competent one is. The entrepreneur needs this type of feedback, but this is not to argue that he has no interest in profitability, per se. Gilmore's (1971) entrepreneurial group scored significantly higher than the general population on the Economic Scale of the Allport-Vernon-Linzey Study of Values. The entrepreneurs' interest in the economic or materialistic aspect of his activities is further supported in a study by Shapero, Garcia-Bouza and Ferrari (1974) of technical entrepreneurs in northern Italy. The researchers analyzed reasons given by the subjects for starting their own businesses, and concluded that economic incentives accounted for 25% of the motivation for starting businesses. It is also interesting to note that two other major factors in the motivation were independence and autonomy (25%), and creativity and job satisfaction (20%).

A number of different attitudes toward money were expressed by women business owners interviewed by Demarest (1977). Some considered money as an indicator of success, while others viewed money as a means to either an altruistic or occupational end. The latter group depended more on the gratification of a job well done than on monetary rewards for their self-esteem.

Theoretical writers consider problem solving to be an important function of entrepreneurship, and this is also borne out by empirical studies. According to Danhof, an entrepreneur "is primarily concerned with changes in the formula of production over which he has full control" (1949, p. 21). Danhof perceived entrepreneurship as obtaining relevant information, evaluating the information with regard to profit, and setting the operation in motion. These, together with the implied step of decision making, are part of the process of problem solving. Evans made decision making explicit when he viewed the entrepreneur as: "the person....who has the task of determining the kind of business to be operated" (1957, p. 50). He further noted that once this decision is made, the entrepreneur must be continually alert and ready to make new decisions in light of changing market conditions and arising opportunities. Lamb also alluded to the decision making role when he stated: "entrepreneurship is that form of social decision making performed by economic innovators" (1952, p. 91). The functions of problem solving and decision

making were also implied in Scanlan's (1978) study, which found two types of entrepreneurs to score high on the Investigative scale of Holland's Vocational Preference Inventory.

Psychological studies suggest that entrepreneurs have a desire for immediate information about their performance (Secrest, 1975). It is so important for them to be successful that they will listen to negative as well as to positive feedback and use it in order to change their strategies or their goals to increase their probability of success (Berlew, 1975). In his study of Research and Development entrepreneurs, Schrage found that the more successful of his subjects spent "much time looking for answers in the marketplace" (1965, p. 61).

Once relevant information is collected, the entrepreneur uses his increased knowledge to change either his strategies or his goals. He is seen to be flexible and adaptable in his decision making (Berlew, 1975). He also makes his decisions without delay. Swayne and Tucker agreed with this, and stated:

Entrepreneurs do tend to make management decisions too quickly from an omniscient point of view, but more important, rapid decision making, and implementation is essential to any new organization, else the company dies of procrastination (1973, p. 66)

Swayne and Tucker also suggested that the entrepreneur does not react quickly just because it is a matter of life or death for his company. He does so because it gives him a sense of "power, motion and accomplishment" (1973, p. 66).

ENTREPRENEURSHIP AND NEED FOR ACHIEVEMENT

McClelland (1961) was among the first to study the relationship between the need for achievement (n-Ach) and entrepreneurship. He found a fairly high degree of consensus in the relevant literature that many qualities that characterize a person high in n-Ach such as desiring to achieve excellence for its own sake, taking moderate risks, taking responsibility for one's own actions and looking actively for feedback, were also characteristic of entrepreneurs. He hypothesized that high need for achievement should drive a man to become an entrepreneur, and carried out a number of studies which he claims supported his hypothesis.

Kilby discusses in detail the three experiments which McClelland carried out to prove the hypothesis. Though admiring "the ingenuity and empirical orientation" of McClelland's analysis, he found that it was "characterized by problems arising from loosely defined variables, biased sample data and weakly linked multi-stage arguments" (1971, p. 16). With the exception of one out of five groups in one of the experiments, the correlation between need for achievement and preference for business occupations were either very small and not statistically significant, or negative. Kilby reports:

Somewhat surprisingly, in Motivating Economic Achievement, McClelland refers only to the Wesleyan sample (that showing a positive correlation) and states as a previously established

fact that individuals high in need for achievement are predisposed towards business careers (1971, p. 18).

McClelland and Winter (1969) describe an apparently successful program which was based on McClelland's hypothesis and designed to train people to increase their achievement motivation. Reviewing this experiment, Borland (1975) commented that it was not surprising that n-Ach, as measured by the Thematic Apperception Test (TAT), showed an increase, since the subjects were taught exactly how to score higher on the test. She further stated:

Thus, though McClellan's program did seem to increase entrepreneurial activities in some people, the changes did not seem to be brought about by increased achievement motivation. Rather, an increased orientation towards problem solving and taking initiative coupled with ready opportunities to use initiative appeared to be factors most likely to have caused the observed changes (1975, p. 9).

Other studies relating need for achievement to entrepreneurship show inconsistent results. Meyer, Walker and Litwin (1961), Hornady and Bunker (1970), Lynn (1969), and Hines (1973) have all reported finding that entrepreneurs have higher achievement motivation than average adults, university students, engineers, and middle managers. The study by Schrage (1965) found that entrepreneurs of profitable research and development firms did not score consistently high in achievement motivation, and that high achievement motivation had the effect of increasing profit or loss. Schrage held that the important variables effecting profitability was what he called Veridical Perception. He defined Veridical

Perception as "the act of recognizing people, things, or situations as they truthfully are, rather than attributing to them qualities which are the products of one's emotions or imagination" (p. 57). Wainer and Rubin (1969) later reanalyzed Schrage's data and voiced concern over the validity of his findings with regard to achievement motivation.

Gilmore (1971) found that his group of entrepreneurs scored high as well as low in need for achievement, and those with moderate scores had the highest sales growth rate. While accepting need for achievement as an "average" indicator of successful entrepreneurs, he recommended that it warrants considerable additional research. Borland (1975) found that her results suggested that:

Need for achievement energizes but does not channel achievement oriented behavior. It activates people to seek success, but does not impart such a specific direction to one's activity as McClelland hypothesizes when he states that those with high n-Ach are most attracted to entrepreneurial activity (p. 116).

ENTREPRENEURSHIP AND LOCUS OF CONTROL

The construct of Locus of Control, developed by Rotter (1966), describes the degree to which individuals believe that personal reinforcements are contingent upon their own behavior. People with a high internal locus of control (internals) believe that they have control over their own lives, and what happens to them depends on their own decisions and abilities. Those with a high external locus of control (externals) believe that they are

controlled by forces which are external to themselves and believe what happens to them is controlled by "powerful others," fate, change or some such factor.

A number of studies have linked locus of control and entrepreneurship. Shapero, Garcia, Bouza and Ferrari (1974), Driver (1973), Borland (1975), Brockhaus (1975), Demarest (1978) and Scanlan (1978) all have reported a positive correlation between one's entrepreneurial activity or intentions and one's belief that events are contingent upon his/her own behavior rather than upon luck or fate.

In a comprehensive review of the literature on the internal-external (IE) control variable, Joe (1971) discusses a number of studies relating IE to a number of personality variables. Two of these variables which are attributed to internals, achievement motivation and risk-taking behavior, are also attributed to entrepreneurs.

Rotter (1966) argued achievement motivation to be a logical extension of the concept of internal-external control, and hypothesized that internals would show more overt striving for achievement than externals who feel that they have little control over their rewards and punishments. Studies by Gurin et al. (1969) and Lao (1970) support this hypothesis.

Research directed toward the relation between internal-external control and risk taking behavior is somewhat meager, but

there is some evidence to show that the risk-taking patterns of internals is similar to that of entrepreneurs. A study by Liverant and Schodel (1960) supported the notion that internals are more inclined to take intermediate risks than externals who are inclined to take extreme risks. Entrepreneurs also tend to take moderate risks (McClelland, 1961). The moderate risk-taking patterns of internals is supported by the studies of Strickland, Lemick and Katz (1966) and Julian, Lichlman and Ryckman (1968). Meanwhile, two studies (Lefcourt and Steffy, 1970; Minton and Miller, 1970) reported no relationship between the I-E scale and risk-taking behaviors.

It appears from the literature than an entrepreneur would tend to exhibit those qualities associated with internals--show initiative in controlling the environment, be achievement oriented and be moderate risk-takers. The literature offers some support to the contention that entrepreneurial types believe that they have control over events.

The foregoing literature review was conducted during the first phase of the MMEE project. This resulted in a list of skills which seem to characterize entrepreneurs.

Each of these skills is described below:

INNER CONTROL:	Exercising control over life situations rather than letting them be determined primarily by chance, fate, or other people.
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INNOVATION:	Applying ideas, borrowed or original, to situations where they have not been used before.
DECISION MAKING:	Generating appropriate solutions to situations and carrying them out.
HUMAN RELATIONS:	Acting in ways which reflect an understanding of one's own and others' needs, values and goals.
PLANNING AND GOAL SETTING:	Designing and carrying out a course of action for the future.
REALITY PERCEPTION:	Seeing people, things or situations as they are rather than distorted by emotions, imagination or faulty assumptions.
RISK TAKING:	Taking informed action in situations where uncertainty exists.
USING FEEDBACK:	Collecting and using information for the purpose of confirming or changing perceptions, decisions, plans or goals.

An examination of the descriptions of the eight skills reveals considerable overlapping and interrelationship among them. For example, in making decisions, risk taking is often present, since uncertainty about the results of decisions usually exists. Likewise,

using feedback is important when evaluating the results of the decisions. Similarly, in order to exercise inner control, planning and setting goals, using feedback and reality perception are often essential.

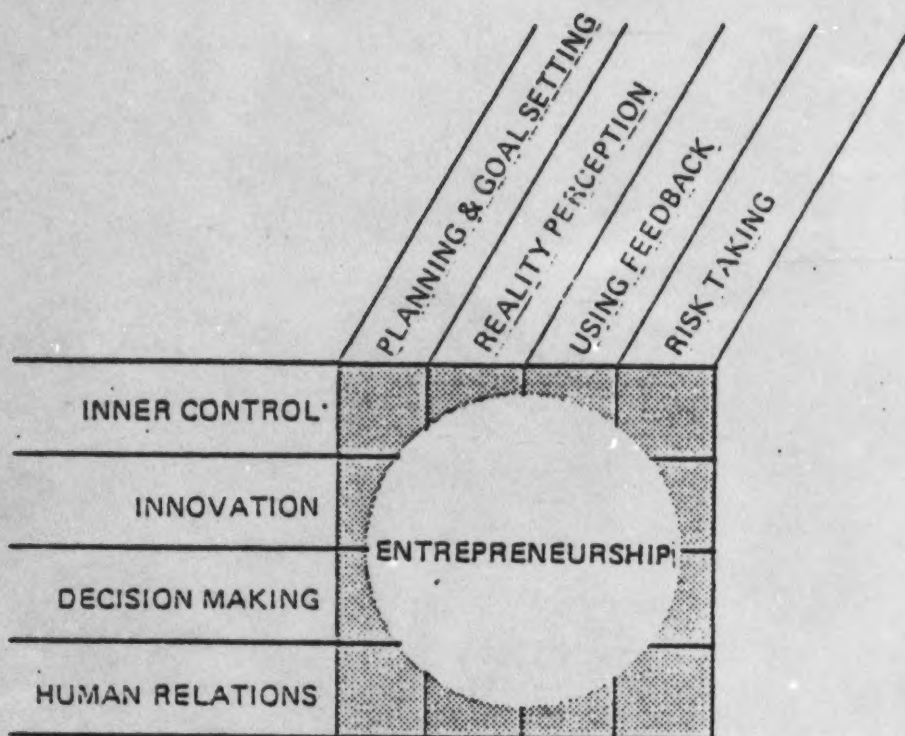
A consideration of possible relationships among the eight skills suggested that entrepreneurship could be represented as an integrated group of skills. Figure 1 is a somewhat oversimplified depiction of the relationships among the eight skills.

For the project staff, this depiction served two purposes. First, it organized the complex construct of entrepreneurship into a reasonably simple, understandable form. Second, it acted as a structure on which to develop instructional materials.

LEARNING ENTREPRENEURIAL SKILLS

The instructional materials were developed during the second phase of the project. Activities for learning entrepreneurial skills provide a common core of experiences for all students. Four units of classroom and out-of-class activities included: 1) Inner Control, 2) Innovation, 3) Decision Making, and 4) Human Relations. Within each of the four units, the skills of planning and goal setting, reality perception, using feedback, and risk-taking are addressed in relation to the unit topics. In this way, an integrated approach is adopted which is compatible with the depiction of entrepreneurship presented in Figure 1. A total of nineteen classroom sessions are structured.

FIGURE 1



Each session includes an objective, one or more class activities, teaching aids, and out-of-class assignments.

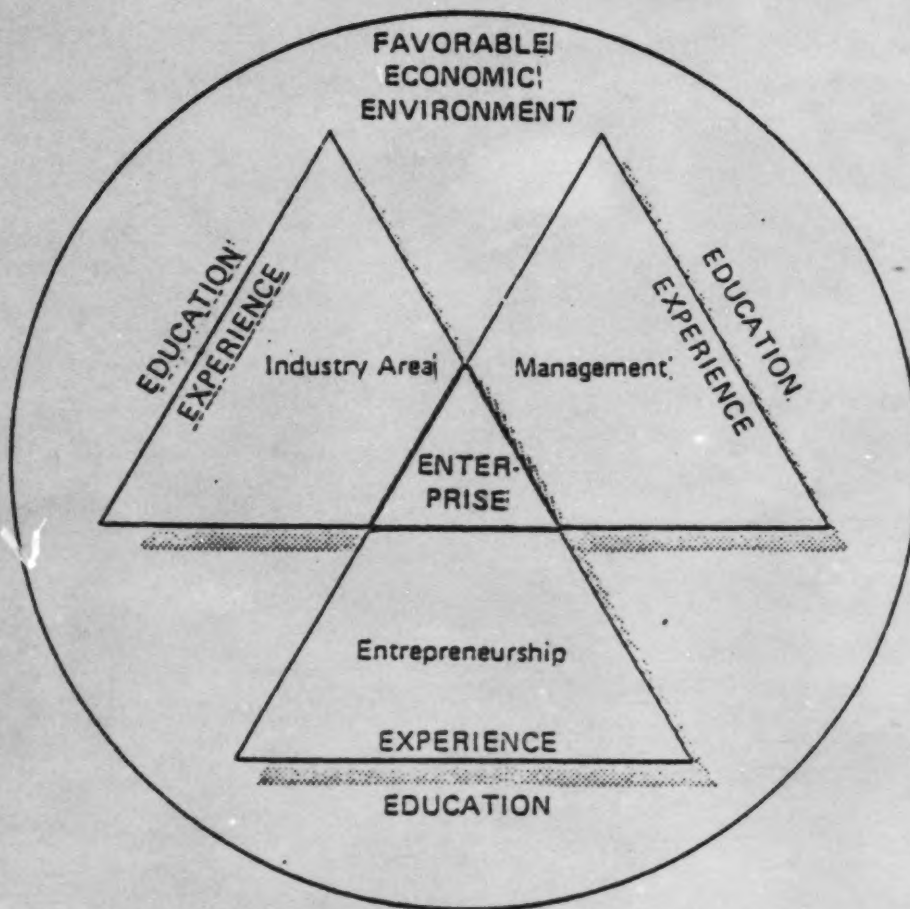
The out-of-class assignments are related to in-class activities, and require students to relate the entrepreneurial skills to their own lives. These assignments are emphasized because they help students begin the process of internalizing and integrating the skills into their habits of thinking and acting. They are designed to be personalized extensions of classroom activities.

Reflecting on actions taken is encouraged through the use of student journals. In journal entries students are asked to record their personal reactions to their experiences in observing and practicing the skills. Further reflection is encouraged by a discussion of the out-of-class assignments at the beginning of the class period following each assignment.

APPLYING ENTREPRENEURIAL SKILLS

For instructional purposes, business ownership was selected as a specific situation in which entrepreneurial skills are applied. Excellent examples of entrepreneurs are those who establish their own enterprises. To be successful, however, business owners need other skills and knowledge in addition to entrepreneurial skills. Figure 2 illustrates the ingredients for launching and maintaining a successful enterprise.

In order for a business enterprise to prosper, ability in three areas must be brought together: 1) entrepreneurial skills,



2) business management skills and 3) knowledge and skills in an industry, service or trade. Ability in these three areas can be acquired through experience and education.

Weakness in any of the three areas can endanger the survival of an enterprise. When starting and operating a business, an entrepreneur should carefully examine the situation, identify possible weaknesses and compensate for them.

Those who own and operate larger organizations may not themselves need ability in all three areas. Provided that they can delegate effectively, they can hire experts in the management and industry areas. The owners of smaller business may take in partners who have skills complementing their own and seek out the advice of accountants, attorneys, and bankers. It seems, however, that entrepreneurial skills are essential for owners of both small and large businesses.

The instructional materials emphasize entrepreneurial skills, but also consider the other skill areas. During the class activities, students are introduced to a number of management skill areas. Readings in the areas are assigned and discussed in class. These include U.S. Small Business Administration pamphlets which are available free of charge, as well as selections from texts on small business management. Through class discussions and assignments, students are encouraged to consider both entrepreneurial and management skills within the

context of their specific self-employment interests. The materials are designed primarily for adult students at the community college level, who will have developed or may presently be developing work skills in specific industries, trades or services.

The application of the skills to business start up situations is achieved through four student projects, each of which takes about two weeks. Much can be achieved within the classroom to alert students to the importance of entrepreneurial skills. This valuable learning can be enhanced and reinforced if it is followed by a structure which allows students to apply the skills to their interests in a realistic, practical manner. The following propositions, which appear vital to the development of entrepreneurial ability, were used by project staff as bases for developing the project format and resources.

1. Entrepreneurship cannot be learned within the classroom walls. Vital learning takes place in the everyday real world in which entrepreneurs work. Classroom experiences should be designed to enhance this learning.
2. Contact with entrepreneurs is essential. Research has shown that up to 75% of entrepreneurs had parents or other role models who were self-employed. While an educational program obviously cannot provide students

with self-employed parents, it is possible to arrange opportunities for students to observe and talk with self-employed people. These contacts can serve several purposes, one of which is to recognize that people like themselves have started their own businesses. One writer has called this type of person a "credible example" (Shapero, 1977). Contact with this person leads the potential entrepreneur to think "If that person can do it, so can I."

3. Emphasis should be on action, on doing. While certain kinds of knowledge are necessary, the essence of effective entrepreneurship is action. Therefore, entrepreneurship education should encourage students to act and to learn from their actions.
4. The structure of an entrepreneurship education program needs to put responsibility for learning increasingly on students. Entrepreneurs are essentially initiators. As

time passes, the structure provided by the instructor needs to be decreased in order to encourage initiative.

5. Because students are likely to be at different levels of development in their ideas about self-employment, entrepreneurship education needs to be flexible in responding to different levels.
6. Structuring learning around students' interests is likely to help maintain a high level of motivation in students. Being highly action-oriented, entrepreneurs are likely to become impatient with material they consider irrelevant. By individualizing learning experiences, students focus their attention on issues relevant to them at a particular time.

These propositions are reflected in the project format which is included in the instructional materials. For example, the projects are implemented with the help of business owners, who agree to meet with students on a one-to-one basis. In this

way, the business owners help serve as credible examples for students who may be unfamiliar with self-employment situations. These contacts also help students to gain a realistic perspective for the completion of their projects and to build up a number of business contacts in the community.

Projects also give students opportunities to practice and observe entrepreneurial skills in action. They see how risk taking, decision making, using feedback or information play a vital role in business operation. In planning and completing projects and in presenting project reports in class, students put into action skills and information learned in the class sessions.

A considerable portion of student learning at this stage needs to be individualized. Gradual individualization of instruction tends to encourage the development of independence, a quality for which entrepreneurs are noted. At the project stage, instructors will probably be most effective if they see their role as facilitators helping potential entrepreneurs to manage their own learning. The materials include resources such as project ideas and pre-designed projects to facilitate individual learning.

Nine general project areas are suggested, although some students may wish to develop their projects in other areas: deciding on product and market, selecting a location, obtaining

initial capital, choosing the legal form of organization, record keeping, credit and collections, advertising and sales promotion, employee and community relations and insurance.

AN EDUCATIONAL PARADIGM

Three phases in the development of entrepreneurial skills are PREPARING, ACTING and REFLECTING. In Figure 3, these three phases are symbolized by the letters P, A, and R respectively. The left-hand portion of Figure 3 shows a way to conceptualize the learning of entrepreneurial skills.

PREPARING includes two kinds of readings: critical incidents and material about skills areas. Critical incidents are true life examples of instances in which people use or fail to use entrepreneurial skills. They illustrate important points relating to entrepreneurial skills. Other reading materials explain different aspects of the skills, or suggest techniques for developing them. These readings are contained in the book, Supplementary Readings.

ACTING includes both in-class and out-of-class work. Instructions and materials are contained in the book, Learning the Skills. In-class activities are essential to introduce and demonstrate important concepts. Out-of-class assignments are related to in-class activities, and require students to relate the entrepreneurial skills to their own lives. These assignments are emphasized because they help students begin the

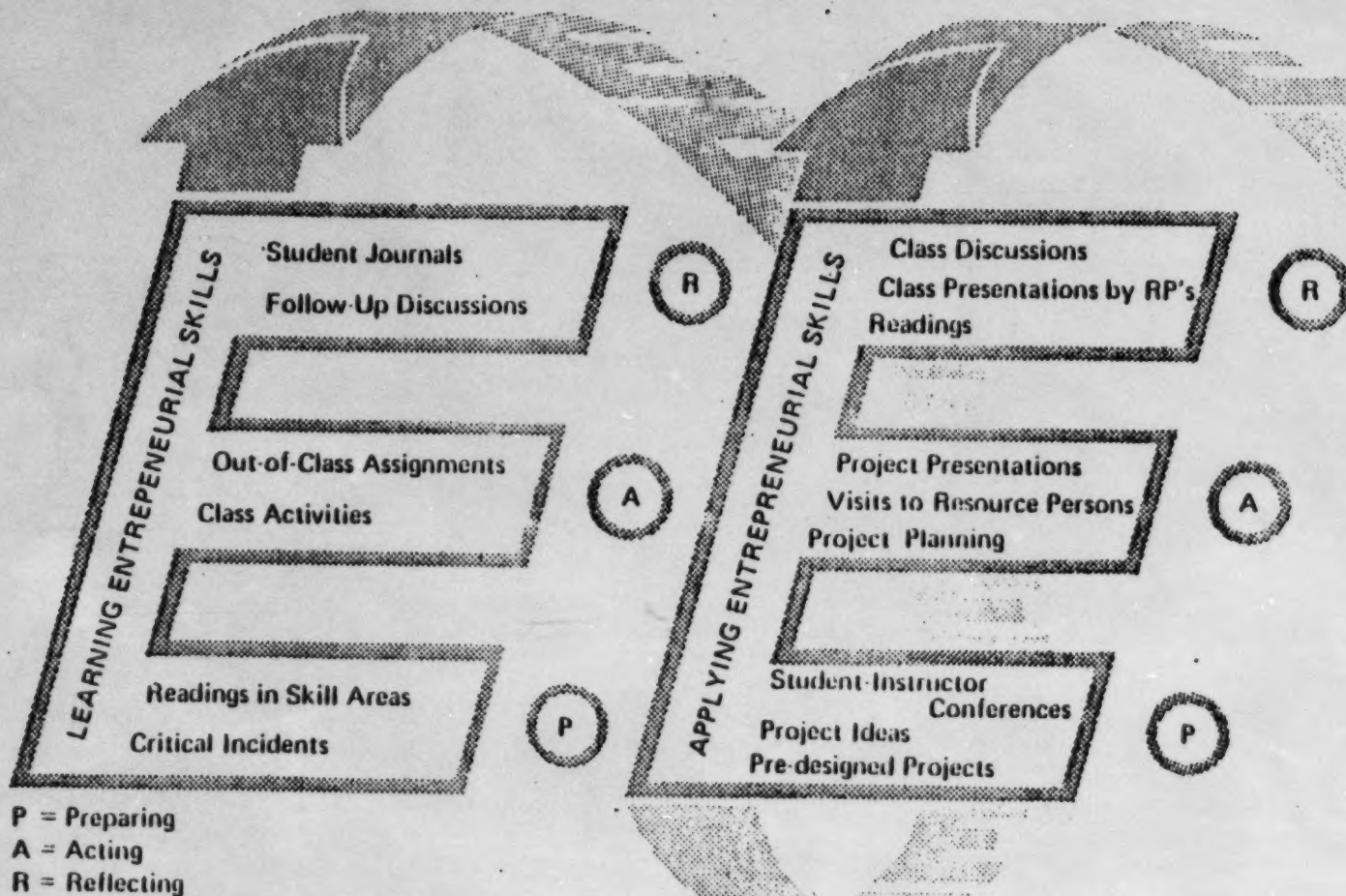


FIGURE 3

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process of internalizing and integrating the skills into their habits of thinking and acting. They are designed to be personalized extensions of classroom activities.

REFLECTING on actions taken is encouraged through follow-up discussions of out-of-class assignments and through the use of student journals. In journal entries students are asked to record their personal reactions to their experiences in observing and practicing the skills. Further reflection is encouraged by a discussion of the out-of-class assignments at the beginning of the class period following each assignment.

Through the combination of preparing, acting, and reflecting students encounter the entrepreneurial skills in the cognitive, affective and behavioral domains.

The right-hand portion of Figure 3 summarizes the phases of PREPARING, ACTING, and REFLECTING at the application level. A number of aids are provided to assist students in PREPARING phase. These are contained in the book, Applying the Skills. Predesigned projects acquaint students with project format and design. Some students may wish to follow predesigned projects at first to help them get a feel for the process. Project ideas are provided as aids in raising issues students might investigate as parts of their projects. Predesigned projects and project ideas have been developed for each of the nine areas.

Conferences between students and instructor are necessary to help familiarize students with how to design their projects. These conferences may include small group and class discussions as well as one-to-one contacts. Since projects are based on the interests of students, one-to-one conferences are useful in the PREPARING phase.

The ACTING phase includes the actual planning of projects, visits to resource persons and presentations of projects in class. In planning and carrying out projects, emphasis is placed on practicing and observing the entrepreneurial skills. It should be noted that the success of student projects depends in large part on their relevance to students. Projects are not empty exercises for the purpose of giving students grades. The issues investigated by students should result in plans, decisions, and information which are directly applicable to businesses they expect to start in the future.

The REFLECTING phase provides students with opportunities to think about what they are accomplishing. Additional reading is done in project areas, presentations are given in class by resource persons, and completed students projects are discussed. REFLECTING is a highly important complement to ACTING, because it gives students a chance to learn from what they have done. This combination of ACTING and REFLECTING builds into the process one of the entrepreneurial skills--using feedback.

As illustrated in Figure 3, learning and applying entrepreneurial skills should be viewed as a cyclical process. At the learning level, the cycle occurs nineteen times--one for each class session. At the application level, the cycle occurs four times--one cycle for each project.

ADAPTING THE MATERIALS

The materials were field tested in business courses at four community colleges across the state. Adult students with work experience came to the entrepreneurship education course to consider self employment as an alternative to their present occupations. Many of them felt they were in a better position to make decisions about themselves and self employment. Some started on a part-time basis in order to develop their skills further before committing themselves to full time self employment. Others decided they were not ready for self employment: additional work experiences or courses in small business management were needed before starting their business ventures.

At additional field test sites, some instructors are developing other applications of the materials, and these instructors are enthusiastic with results. Pat Christell of Moline Learning Center teaches paraprofessionals who are re-training for occupations in human service agencies. She has adapted the projects to focus on themes such as brokering, advocating, counseling, rehabilitating and information management. These adaptations enhanced the value of the student's work experiences.

Bob Scharsich also used the entrepreneurship education approach with his cooperative education students at Wheaton High School. He found that the approach helped students gain a new perspective on their careers. Students were able to see the work situation from the employers' point of view. As for self employment, some students decided that they did not want the responsibility. Others regarded it as a challenge and a future possibility.

Entrepreneurship education is a new approach to careers and career education. Primary emphasis is placed on the person rather than on the occupation, and its purpose is to develop initiative and self-reliance. The limited field testing to date does not allow definitive evaluation, but so far, the reactions of students and teachers have been positive. Results of the preliminary field testing were used to revise the materials on the basis of feedback from the instructors and students. Comprehensive testing in a wide variety of settings will begin in the fall as the materials are being disseminated. The principal target group will be students who are interested in exploring self-employment as a career. A question for this audience is: What is the relevance of entrepreneurship education for adults in the process of career change?

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Interface Between Technical Teacher Education and Mid-Career
Change Clients of an Adult Resource Center: A Model
for the Identification of Potential Vocational-
Technical Teachers

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Career Change

Do you recognize the follow excerpt from children's literature:

"Would you tell me please, which way I ought to go
from here?" asked Alice.

"That depends a good deal on where you want to get
to," said the cat.

"I don't much care where--," said Alice.

"Then it doesn't matter which way you go," said the
cat.

This thoughtful gem by Lewis Carroll from Alice in Wonderland
will serve as an introduction to the topic of career change which is
the theme of this conference. Career change needs direction and care-
ful planning.

According to Willis Harman, director of the Educational Policy
Research Center of the Stanford Research Institute, we can expect indi-
viduals to have several careers during a lifetime, not because of job
obsolescence but because "it is in this way that he best realizes his
own potentialities and maximizes his own fulfillment (Newman, p. 60)."

It is now being predicted that people will become more multi or bi-occupational. This typically would mean that a person chooses one job in a high demand field to earn a living and the other in an occupation which meets his fulfillment needs.

Personally, and speaking as a futurist, I would not discount advancing technology as a major factor in increasing the rate of career change. Advancing technology and career fulfillment should not be separated when planning career change. Not only do young people face a radical break with the past, but they must also be trained for an uncertain future.

Buchtel (1979), in a paper delivered at the American Vocational Association 1979 Convention, indicated a concern "That many of the skills we have taught and are still teaching will be obsolete and non-transferable in later life." He feels that those of us in vocational education should look at our programs "with the intention of developing a broad knowledge foundation that will assure the student of adapting to new skills and changes,". . . to "learn to learn, unlearn, and relearn . . ." He concludes that educational planning should be aimed at the attainment of occupational adaptability and personal change competencies.

Two years ago (in 1978) the College Board reported in their publication, Forty Million Americans in Career Transition, that 36 percent of the U.S. population between 16 and 65 percent were either in actual career transitions or anticipated career transition.

Ashley and Faddis in their study of occupational adaptability and transferable skills described occupational mobility as "any move from one job to another (178)." They further stated:

This includes all changes, from a lateral transfer within the same firm (e.g., from forklift operator to crane operator) to major career changes (e.g., a garment cutter finds her job mechanized and starts a new life in the theater). Any of these job changes can include major and/or minor differences in knowledge, job skills, environment, context, and expectations. From this perspective, mobility also includes voluntary and involuntary movements, mid-career occupational change, school-to-work or home-to-work transitions, within-industry transfers due to elimination or restructuring of previous jobs or the creation of new ones . . . (179).

Dealing with Adult Career Change: The Adult Resource Center

In this section we will take a close look at one mechanism that has proven successful in meeting the needs of adults concerned with career change.

Who are these adults? Here are some brief biographical sketches of actual clients:

Male, approximately 28 years old, son of bank executive. College degree from prestigious institution, but recipient has no career in mind. Seeking career/lifeplanning service as an effort to select career objective independent of parental influence. Recognizes that he may need additional education.

Female, 50 years of age, with career experience in advertising and journalism. Has credit from many universities throughout the country, but none leading to a specific degree. Now faced with unem-

ployment. She is discovering that she has too much experience and no specific degree from college.

Woman, 35, recently widowed, who inherited a small neighborhood business. Interested in information about business management which could later be counted toward a degree.

Twenty-four year old woman, divorced, with three children to support. Works as a receptionist for a doctor. Interested in enrolling in college to prepare for a better future.

Male, with two children to support. Interested in reentering the University to improve skills. Holds an Associate degree in Data Processing from another university.

Female, 28 years old. Teacher, unhappy in classroom, but reluctant to seek additional education or training until she investigates other career alternatives. Wants to enroll again in the University, but is uncertain of the career direction.

What Is the Adult Resource Center?

The Adult Resource Center (ARC) directed by Kathryn Vegso is one unit within the Division of Continuing Education and Public Services at the University of Akron, Akron, Ohio.

It is important to know something of the institution in order to fully understand what makes the ARC the outstanding success that it is.

The University statement of goals and purposes sets forth as Goal 1: 'The University will plan, develop, implement and measure all

of its efforts in light of its primary purpose to provide optimum learning opportunities for students of a variety of ages, backgrounds, and needs" (University of Akron, 1979, p.6).

The goals and purposes also include the statement that:

Program offerings, both credit and non-credit, as well as course accessibility and scheduling will recognize that the University's constituency includes:

- recent high school graduates;
- persons transferring from other institutions;
- older persons with lifelong learning commitments or with specific learning or self-enrichment needs;
- persons who can attend only part-time;
- persons who must interrupt their attendance from time to time;
- persons who can attend only at night (p. 6).

The student body includes approximately 15,000 day credit students and 8,000 evening credit students plus about 7,000 students enrolled in non-credit courses for an overall total of approximately 30,000 students. A majority of our students work either full or part time.

The academic structure of the University of Akron covers the complete educational spectrum from two-year associate degree programs, through four-year baccalaureate programs, to master's degree programs and programs of study leading to the doctorate.

Students who desire a two-year technical program enter the Community and Technical College. Those interested in a non-technical baccalaureate program begin studies in the General College before admission into one of the seven degree-granting colleges.

Within the setting of the urban environment the Adult Resource Center serves as a brokerage service which provides educational infor-

mation, guidance and referral, and reflects a collaboration among the educational, business, governmental, and social service agencies of the community. The ARC serves as a community education center providing career and life planning services for individuals and providing related activities and programming for organizations in the University service area. The ARC as a brokerage service represents a new network of educational services for the total community; a new approach to adults making career and role changes; and a new focus on adults as prospective learners with unique needs.

The ARC, in attempting to identify the interrelationships between education and work at the various stages of adult life, schedules and conducts seminars and workshops for adult which focus on helping individuals plan ways to make greater use of their human potential.

The ARC utilizes "learning consultants" at community and campus sites to help individuals identify and gain access to learning opportunities. The University responded to 12,000 adults in the community over the last eight years through career and life planning seminars aimed at adults seeking information pertaining to the options available to them as they made career and life decisions at various transition points of their lives.

The ARC, established in 1978, in its Annual Report of June 1979 (Vegso) indicated that with a nine-month period of operation, one hundred prospective adult learners per month were provided individual conferences and group programming by learning consultants.

Programs of the ARC met the needs of adults from a variety of ages, marital status, and income. Most clients were in the 26-41 age group (51 percent were 26-33), 58 percent were married, 94 percent were caucasian, 38 percent had not attended college or advanced training, and income ranged from \$8,000 (25 percent) to over \$30,000 (16 percent) during Spring Semester 1979.

The ARC Annual Report indicates that adults seem to respond positively to the supportive climate in which the Learning Consultants use a life span approach. The learning consultants identify transferable skills which can be developed in a certain major rather than center their career information on specific jobs related to that major area of study. Adults typically want to identify new career options, prepare for upward mobility in their present employment, or assess their interests and needs due to transitional lifestyle changes.

The foundation of the ARC is the recognition that by continuing to learn, one may improve the quality of life over the life span. The eleven process goals as outlined by the ARC director include:

1. Teach a decision-making process to assist persons in making life choices.
2. Teach process skills through which an individual can identify transferable skills.
3. Teach skills necessary for career and life transitions.
4. Reach out to populations which are not taking advantage of learning opportunities in our community.
5. Plan specific short-term learning experiences aimed toward target groups.
6. Develop media, materials and programs which extend to where the learner works or lives.

7. Involve potential learners in the planning process.
8. Involve persons in the service delivery who already have made life transitions.
9. Serve an advocate role to the adult entering the process of continuing to learn:
10. Develop alliances with the community's educational, business, governmental, religious, recreational, and social service units.
11. Maintain communication with the university's departmental and student services units.

The ARC provides educational and occupational information which assists adults in making realistic plans. The ARC also assists adults in making the best use of learning opportunities which are accessible to the learner.

The ARC confirms the following about prospective adult learners:

1. Adults prefer traditional methods of learning but with skilled faculty who understand adult learners.
2. Adults prefer flexible registration and delivery systems, including off-campus locations for both.
3. Adults prefer classes which meet for longer periods, two days per week, and in an eight to twelve week time span.
4. Before enrolling, adults seek information about themselves, new career options, and decision-making processes, as they actively participate in planning their future education.
5. Adults lack information about educational opportunities, financial aid, and job-seeking skills.
6. Adults present interrelated problems and lack knowledge about the helping services, both off and on campus.
7. Adults are highly motivated to learn but want a supportive climate for inquiry where they can identify with others who have successfully made similar decisions.

8. Adults are consumer-oriented regarding their choice of continuing education as they have more options available (from a multitude of sources).

Through the development of the Adult Resource Center, this University is considered as a model for learner-directed techniques to recruit adult students (Vegso).

Before moving on to the next major area of this paper, the identification of potential vocational-technical teachers, let me again point out that the ARC is dealing with motivated adults, in most cases ready to return to an educational environment, who possess a wealth of experiences and often extensive occupational skills, and who in most cases are ready to make a major career change. Who could ask for more in the way of "raw material" when looking for a source of potential vocational-technical instructors. The interface, by now should be obvious. The ARC learning consultants recommend that selected clients consider Technical Teacher Education when appropriate to their career goals and when a flexible degree program is of utmost importance to the client.

Technical Teacher Education

The Technical Teacher Education program of the University of Akron is now in its tenth year of successful operation. The major objective of the program is to prepare instructors and other educational personnel for post-secondary educational institutions, industry, and public and private agencies engaged in the education and training of middle-level workers and technicians. The degree program includes

work in the areas of general studies, the technical specialty, professional education, and occupational experience. Programs are individually designed for each student in any of the following areas: business technologies, engineering technologies, health technologies, natural science technologies, and public service technologies.

At the present time we advise approximately 360 undergraduates (full-time and part-time) and 235 graduate students in Technical Teacher Education. What makes us so attractive? We advertise "Build your own degree programs" (up to 51 semester hours) and stress that we provide technical skills, leadership skills, teaching skills, and job skills. All prior college credits transfer into our B.S. program and we offer limited credit for related work experiences.

The Need

The recent and rapid development and growth of two-year colleges in the form of community colleges, technical institutes, technical colleges, state general and technical colleges, with a multitude of technical education curriculum and courses, has created a critical shortage of properly trained technical education instructors (Sugarman, 1974).

The present source for technical education instructors covers a wide spectrum. These sources range from highly qualified and experienced professional and technical personnel in industry, commerce, engineering, and nursing to those who have received their training in professional education in the areas of business education, vocational education, and industrial education. A significant number of retired armed forces

technicians and public service (law enforcement, etc.) personnel have also been recruited. Very few instructors have been specifically prepared for teaching careers in post-secondary technical education. The University of Akron is the only institution in Ohio presently engaged in a specific program for training qualified technical education instructors.

The educational preparation and the attainment of the post-secondary instructor spans a wide range and cannot be generalized at a specific level.

It is generally recognized that the educational standards for the employment of the technical education faculty differs from that of the academic faculty. This is frequently dependent upon the supply and demand of the market place and the belief that occupational experience is usually of greater value to the technical instructor than the attainment of a master's degree in a distantly related area. Graduate programs in many technical specialties are simply nonexistent.

The Models

It is possible to hypothesize several variations of models for the preparation of technical instructors. The ongoing Bachelor of Science and Master of Science programs in Technical Education at the University of Akron are but one example of an existing model. Unfortunately, four or five years of full-time education is not necessarily the most practical model to meet the immediate state-wide faculty and staff needs of two-year campuses which offer programs of technical

education. The demand for an increasing number of well prepared instructors is obvious.

In the degree model the associate degree graduate may continue his education through two distinct routes at the University of Akron. The student has a choice of the Bachelor of Science in Technology program offered through the Community and Technical College in specific areas or the Bachelor of Science in Technical Education offered through the College of Education. Graduates from either one of these programs may then continue on to earn a Master of Science in Technical Education in the College of Education.

The Bachelor of Science in Technical Education (B.S.T.E.) was developed to prepare occupational education instructors for post-secondary institutions, two-year colleges, technical institutes, and industry. Some graduates have also found teaching positions in police training academies, hospital schools of nursing, occupational therapy training programs, and industrial training programs.

The program leading toward the Bachelor of Science in Technical Education is designed to admit the associate degree technical graduate from any accredited two-year college in the broad technology areas of allied health, public service, natural science, business, and industrial and engineering technologies without loss of academic credit.

The B.S.T.E. is designed around a technical content of 51 semester hours of individually programmed technology and job related courses, 39 hours of general studies, 25 hours of professional education designed

to prepare the student to teach at the two-year college level, and 13 hours of electives.

Included within the professional education component is a block of 6 hours of student teaching and a seminar in which the student has the opportunity to function as "an assistant to the professor" in a two-year college or technical training setting.

As part of EPDA Project 72042 (Sugarman, 1973) we proposed five different models to meet the need for new instructors in post-secondary occupational education:

1. A pre-service and in-service model for new instructors employed by early summer (this model was actually tested in EPDA Project 72042).
2. An in-service model developed for new instructors employed too late to attend the above pre-service model.
3. An in-service model for present instructors who have not been prepared in professional education programs.
4. A long-term model designed to prepare instructors through a regular four-year college teacher education program designed specifically for this purpose (the B.S.T.E. Program described above).
5. An advanced undergraduate or graduate model designed to update experienced instructors.

The needs of post-secondary occupational teacher education are many, and the approaches varied.

This paper has examined the role of an Adult Resource Center in counseling adults for career change; the identification of adults with technical job skills; or adults who wish to obtain technical skills; and the subsequent training of selected adults to fill the critical need for technical instructors.

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IMPACT OF COMPUTER INFORMATION SYSTEMS
ON STAFF FUNCTIONING IN SCHOOLS
AND HUMAN SERVICE AGENCIES

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FOREWORD

The technological advances in computer sciences have in some respects by-passed the educational community. To date our major use of this sophisticated hardware and software has been for administrative purposes, e.g. scheduling, data recording and payroll. We have given peripheral attention to computer assisted instruction and even less to staff training and development functions. In short, educators at this juncton in time are probably confused by the proliferation of mini and micro computers now available on the open market. It is estimated that computers will affect one out of two humans on a daily basis, now and in the immediate future. In relation to this advance we have not achieved significant advances in training future teachers to use the computer as part of their teaching effort.

The following observations indicate a rapid increase in computer systems, lower costs and a proliferation of networks in the 1980's. Our response and acceptance of computer systems as a valid segment of learning and staff functioning will be limited by

a general lack of computer literacy among educators. Rather than stand in awe of technology, we must move to grasp the liberating opportunity for instruction, staff training and major changes in institutional functioning. Acceptance of computer systems as more than information repositories will require attitudinal changes on the part of educators. What will be taught must also include "how it will be taught" in the computer society of the future.

Vocational and educational guidance have been identified as an important area of concern by personnel working with students, young adults and individuals considering job or career change. A survey conducted by the American College Testing Program found that 50 percent of a 32,000 student sample received little or no help with career planning in their school (Predige, et. al. 1973). Other large surveys such as the National Assessment of Education Progress (1976) also indicated that high school students lacked information on career opportunities and how to seek jobs. They did not know what information to seek nor how to seek it. In a more recent study Jordaan and Heyde (1979) also reported that students' sources of occupational information were inadequate and hindered their career decision making processes. A lack of sufficient career information and limited guidance has confined young adults to a tenuous career decision model.

One component of an effective career guidance program is the dimension of career knowledge and awareness. Decision making relies upon a good source of comprehensive and organized information.

Evaluation of the career information services now available by experts have identified this as an area in need of drastic improvement and increased attention (Bowlsbey, 1975). One approach that has received increased attention in the past few years has been computerized guidance systems. Since 1957 about ten of these systems have been developed and are currently in operation. A few of the widely marketed systems are the computerized-based Career Development System (DISCOVER), the Computerized-Heuristic Occupational Information and Career Exploration System (CHOICES), the Secondary School Computer Information System (SIGI), and the Guidance Information System (GIS). In general, these systems have been well received by users. Studies have shown that users find these systems interesting and motivational conversation pieces at home, preferred over other media sources for guidance information and a fun experience (Rayman and Bowlsbey, 1977; Messina and Voxgerdrian, 1977).

In Maine, various governmental agencies such as Manpower, Labor, Education and Human Services found that there was a lack of up-to-date or compatible data about the world of work coupled with a lack of communication and cooperation among the various agencies which resulted in duplication of efforts and poor utilization of the information available. In 1977, an interdepartmental agency was charged to give special attention to the career search and unemployment problems of youths by encouraging the dissemination

and use of career information in a variety of settings serving young people, and increasing the communication between employers, applicants, and educational training agencies. The Maine Occupational Information Coordinating Committee (MOICC) selected the Guidance Information Service (1980) as a vehicle to increase the career information base at various school and human service agencies. The Center for Career Education at the University of Maine at Orono was awarded the contract for assessing the impact of the computerized guidance system on the users and the staff and programs of the pilot group of secondary schools and human service agencies.

The purpose of this paper is to present:

1. What impact did the system have on the users
2. What impact did the system have on staff functioning

METHOD

DESIGN

A modified time series design was utilized. There were two phases in the study, a preliminary field-testing phase during the spring of 1979 and a second field-testing phase during the fall and winter of 1979-80. Four different measurements were made during the twelve months of the project.

SAMPLE

Thirteen sites were selected to participate in the pilot project. These were six public school sites, two located in large Maine communities, two in moderately sized communities and two in rural settings. There were seven human services agencies, a

Community Action Program (ACAP) from Northern Maine, two CETA sites, a regional office of the Bureau of Vocational Rehabilitation and also the Maine Job Service and two correctional sites: a center for delinquent youth and a minimum security correctional center. The sites were asked to provide a random sample of 30 users per site.

INSTRUMENTS

Six different instruments were developed for the study. Two were designed to gather information about the characteristics of the site; an Agency Characteristic Form and Public School Characteristic Form. To assess the immediate attitudes of the users, Users Logs were developed. A form was developed for both the public school and human service agencies. The respondents were asked basic demographic information such as age, class, program and sex and what files they used. There were six questions for the users to evaluate their experiences with the system and a space for them to write their comments.

For those who did not directly use the computer terminal, a Batch Processing Reaction Form was developed. It contained similar types of questions, but additional ones centered on their understanding of the printout and the type of counseling help provided them.

Two post questionnaires were developed. There was a two page form for agency users and a four page form for public school

users. There were 25 common questions on both forms. The questions related to the impact GIS had on the career planning, educational planning, self-awareness, job seeking and job keeping skills of the participants.

PROCEDURE

The Guidance Information System (GIS) was selected after review of all systems by MOICC. GIS is a sophisticated career information system which consisted of six separate files; Occupational Information, Armed Services File, Two Year College, Four Year College, Graduate School and Financial Aid. Three additional files were developed for use: a Maine Occupational File, Maine Vocational-Technical School File and a Maine Financial Aid File.

Terminals were installed at each site and Training sessions provided by GIS staff and MOICC staff for the personnel.

All site counselors and administrative staff responded to an in-depth interview conducted by Social Science Research Institute to assess managerial impact. Specifically, the purpose of this assessment was to determine program and staff functioning changes in school and human service agencies.

RESULTS

First, the impact of the system on the users will be presented, and then impact on staff. The results of the comparison of Agency and Public School users on the common items on the post questionnaire completed during the second phase of the study is

included in Table 1. The comparison of the Phase One and Two responses on the post questionnaires is included in Table 2.

Responses to the following questions indicated:

1. What impact did GIS have on career decision making of public school and agency users?

Around 80 percent of both groups felt that the computer system was a good way to get information about occupations and that they learned a lot about occupations. About half of both groups indicated that GIS helped them to make a career decision. The system also stimulated them to do more reading or talking about careers.

2. What impact did GIS have on educational and training decisions of public school and agency users?

The system had less impact on educational decision making. About half of the public school sample and one-third of the agency users felt it helped them make educational plans. Twice the proportion of public school users than agency users (51 percent to 26 percent) indicated GIS helped in selecting a specific school or training program.

3. What impact did GIS have on self awareness and self-understanding of public school and agency users?

Neither of the groups saw GIS as a generalized tool to help them learn about themselves. About 40 percent of both groups indicated they did. It had more of an impact on helping them understand their interests, values and abilities. Understanding these characteristics is useful in the career search process. A lesser

TABLE 1

COMPARISON OF AGENCY AND PUBLIC SCHOOL
USERS ON COMMON ITEMS ON POST QUESTIONNAIRE
SECOND PHASE: FALL/WINTER 1979, 1980

CATEGORY AND ITEM	AGENCY PERCENT	PUBLIC SCHOOL PERCENT
EVALUATION:		
Fun to use computer terminal	90.9	90.7
GIS, pleasant personal experience	80.2	78.5
GIS, cold, impersonal experience	2.3	13.0
Easy to understand	88.8	79.4
Type of information wanted	68.5	79.4
People should have human help	3.3	13.2
All people should have opportunity	77.5	77.9
GIS was a waste of time	4.4	26.5
CAREER DECISION MAKING:		
Read books or pamphlets	42.2	46.3
GIS helped a career decision	51.0	50.0
Feel good about career plans	51.2	49.7
Learned a lot about occupations	80.2	68.8
Great way to help choosing occupations	87.8	80.0
Did not learn how to make career decisions	11.2	26.8

TABLE 1 CONTINUED

CATAGORY AND ITEM	AGENCY PERCENT	PUBLIC SCHOOL PERCENT
EDUCATIONAL DECISION MAKING:		
Helped me make educational plans	36.8	56.8
Helped me select specific school	26.1	51.2
GIS helped educational decision	47.0	52.0
SELF AWARENESS:		
GIS helped in self awareness	46.5	30.0
Learned more about my interests	71.6	73.5
Learned about my abilities	56.8	57.6
Learned a lot about myself using GIS	33.7	39.6
Learned more about my values	61.8	61.7
GIS helped job seeking skills	46.0	31.0
GIS helped job keeping skills	22.0	9.0

TABLE 2

DIMENSION/ITEM	PUBLIC SCHOOL PHASE		AGENCY PHASE	
	I	II	I	II
EVALUATION:				
Fun to use	71	90	58	90
Cold impersonal experience	1	13	0	2
Pleasant personal experience	34	79	37	80
No trouble understanding	51	79	--	--
Information excellent	63	79	--	--
All should have experience	43	77	63	77
SELF-AWARENESS:				
Learned a lot about myself	21	46	42	39
Learned about my interests	44	73	37	71
Learned about my abilities	33	57	32	56
Learned about my values	23	61	32	61
CAREER DECISION MAKING:				
Great way to get help	80	80	63	87
Learned a lot about jobs	75	69	69	80
Didn't learn anything new	8	20	5	11
Did reading about jobs	29	46	37	42
Talked with people in jobs	49	36	--	--
EDUCATIONAL DECISION MAKING				
Helped in educational plans	41	56	--	--

proportion of agency users than public school users felt GIS had an impact on self-understanding.

4. What impact did GIS have on job-seeking skills of public school and agency users?

More agency than public school users perceived GIS as helping them in job-seeking skills (46 percent to 31 percent).

5. What impact did GIS have on job-keeping skills?

A very small proportion of agency users (22 percent) and public school users (nine percent) indicated that GIS had any impact on job-keeping skills.

6. How did users evaluate the system the first time they used it?

Few of the users had problems using the system, the guide sheets or the terminal. The system was fun to use, interesting and motivational to users. Most likely the Hawthorne effect was operating in the sites (i.e., they may have given the system higher ratings because it was new and different).

7. How did users evaluate the system after a period of time?

The delayed response to GIS was in general quite positive. Public school users were less enthusiastic than agency users. Over three-quarters of both groups felt that all should have the opportunity to use the system. Some users did report that they were confused after using GIS.

PHASE 1 - PHASE 2 COMPARISONS

There were a number of common items on the questionnaire used in Phase 1 (February-June) and Phase 2 (September-December)

of the GIS Impact Study. The item format and response format changed between the two phases, but comparisons are possible for both immediate reaction to GIS as measured by the User's Log and the delayed reaction as measured by the User Post Questionnaires.

The OCCU (Occupational Information File) was the primary file and was used by over 80 percent of the users in both phases. The COL 4 (four-year college) file was second most frequently used in both phases of the study. In both phases, clients found the purpose clear. Ninety-three percent of the users in phase one concurred as compared with 100 percent of the agency users and 98 percent of the public school users in Phase 2.

The directions for using the GIS Guide and Summary Sheet were clear to the majority of users (88 percent of Phase 1 users, 88 percent of agency users in Phase 2, 89 percent of public school users in Phase 2).

It was a pleasant experience, overall, for all participants. Seventy-one percent in Phase 1 reported they enjoyed the experience. Eighty-eight percent of the agency users and 74 percent of the public school users in Phase 2 felt this way.

More individuals in Phase 2 reported they got the information they needed than in Phase 1 (schools Phase 2, 54 percent; agency Phase 2, 47 percent; Phase 1, 38 percent).

More individuals in Phase 2 reported that GIS helped them in career or educational decisions than in Phase 1 (25 percent in

Phase 2 and 10 percent in Phase 1). About the same percentage in both phases stated it was useful (Phase 1, 63 percent; agency, Phase 2, 60 percent; schools Phase 2, 63 percent).

A comparison of the common items across the two testing periods is given in Table 2. The overall evaluation of GIS by both groups was more positive in the second phase (Sept. - Dec., 1979) than the first phase (Feb. - June, 1979). The only exception was that more public school users reported that GIS was a cold impersonal experience in the second period than the first (13 percent to one percent). The public school users found it more fun to use (71 percent to 91 percent). The agency users increased from 58 percent to 91 percent in rating GIS fun to use. The proportion of users reporting GIS to be a pleasant personal experience doubled (schools, 34 percent to 79 percent) (agency, 37 percent to 80 percent).

There were increases in the rating of the information provided. While 63 percent felt the information was excellent the first time, 78 percent agreed the second time. The number of people understanding the information increased (Phase 1, 63 percent; Phase 2, 79 percent).

A greater number of individuals, both agency and public school users, felt that all individuals should have exposure similar to theirs with GIS (schools, 43 percent to 78 percent, agency, 63 percent to 78 percent).

Users report a greater impact on self-awareness and self-understanding in the second use period. In most cases about twice as many students felt that GIS had helped them understand themselves, their interests, abilities and values. The same trend was true for the agency group except for "learning a lot about myself". Slightly less checked "yes" in the second phase than the first (Phase 1, 42 percent; Phase 2, 40 percent).

There was not as dramatic a shift occurring in career decision making for the public school group as for the agency sample. Overall agency clients felt more positive in the second phase about the help received from GIS, for example, learning about job, reading books and pamphlets about jobs.

A greater percentage, although low, of both groups reported that they didn't learn anything new about decision making as a result of using GIS (schools, Phase 1, 8 percent, Phase 2, 21 percent; agency, Phase 1, 5 percent, Phase 2, 11 percent).

Eighty percent of the public school users on both trials felt that GIS provided a great way to get help in career choice. Slightly fewer said they learned a lot about occupations the second time (75 percent to 70 percent). More were stimulated to do reading in books and pamphlets about jobs in the second trial than in the first (29 percent to 46 percent). Fewer people talked with individuals in jobs the second trial period than in their first (29 percent 36 percent). Also, the students reported

that GIS helped them more with their educational plans during the second stage of the project than in the first.

IMPLICATIONS FOR TRAINING EDUCATORS

Secondly, the study examined the impact of GIS on staff functioning. All site coordinators were interviewed using an interview schedule which addressed how GIS was used and the impact on staff and program.

The GIS program had limited impact on the counseling program. At some sites career education courses were developed and guidance counselors aided teachers in using GIS in their courses. Small group and peer counseling was utilized. Training to use GIS was made available to other counselors and interested teachers, but usually one person at each site was responsible for the coordination and utilization of GIS.

In general, the role of the counselors changed very little; they did not have to spend as much time in information giving; and they had more time for individual and group counseling.

Agency counselors in general had a more difficult time integrating GIS into ongoing activities. The practice in employment agencies of processing a set number of clients per month acts as a deterrent to creative career guidance activity. In addition, the transitory behavior of this clientele made involvement in career development activities very difficult. Many of the persons using

Job Service are 'merely seeking immediate employment' and are not ready to commit themselves to a long term program of career exploration.

It should be noted that one site, a regional office of the Bureau of Vocational Rehabilitation, failed to utilize GIS in their program. It should be noted that all sites, and especially at this site, higher level administrators agreed to participate and directed subordinates to participate. Usually at the sites, there was at least one counselor who was interested or found it fascinating to work with the computer system. One counselor has continued his education by taking additional courses in programming. Another is thinking of using the computer for scheduling students. Nevertheless, there are sites at which there are philosophical differences as to the utilization of such systems. The Vocational Rehabilitation and job service counselors had difficulty both philosophically and operationally to fit GIS into their routines. Serious questions regarding the prior professional training of these counselors and administrators need to be addressed. Our knowledge of their professional backgrounds indicates a serious weakness in systems theory, management by objectives and computer theory. This was a deterrent to full and creative use of GIS.

It should be noted that the counselors had limited planning time and there was more positive endorsement and use in the second phase than in the first. Although counselors received two days

training on the system, they did not appear to change their roles and had limited time to integrate the system into an ongoing program. At many of the sites, it should be noted that there was not an ongoing systematic program of career education or staff development. The model in Table 3 provides a basic format for a short term staff development program to improve computer literacy. Computer literacy is defined as knowing the potentials of computers and how to apply this to functioning in our society.

GENERAL CONCLUSIONS

After reviewing the evaluation data, the following conclusions were generated:

- *Users understood the purpose of GID and had no trouble in using the GIS guide and summary sheet.
- *The system was interesting and motivational to users.
- *GIS is most effective in providing occupation and career information.
- *GIS has an impact on educational decision making, more so for public school than agency users.
- *GIS is not designed to develop job-seeking skills or job-keeping skills, but is perceived by some as aiding them--which may be in part a function of the Hawthorne Effect and/or response set.
- *GIS is not designed to develop self-understanding and awareness but utilizes dimensions of the self in guiding the search process.
- *GIS stimulated a degree of change in guidance programs and the role of the counselor.
- *GIS is not a substitute for a well-designed career education program. The effectiveness of its utilization depends upon

TABLE 3
A COMPUTER IN-SERVICE TRAINING
MODEL

COMPUTER KNOWLEDGE	TRAINING STRATEGY	TIME NEEDED	INSTRUCTIONAL MODE
Improving Computer Literacy	Seminar	8 hours	Lecture/Discussion Self Instructional Materials
Technological Innovation	Seminar/ Field Visits	4 hours	Lecture/Discussion Demonstration
Microcomputers and Education	Seminar	8 hours	Lecture/Discussion Demonstration
Using Institutional Resources	Seminar	4 hours	Group Analysis Lab
Utilization Procedures	Seminar	6 hours	Group Analysis Lab
Developing A Local Plan for Computer Use	Seminar	10 hours	Group Task

how it is integrated into an ongoing, sequential, comprehensive program. It is a valuable tool.

*GIS will not receive full utilization unless computer literacy of the staff is increased and developed.

DISCUSSION

Certain problem areas have been identified. The first deals with strategies for change. Support has to be based upon adequate needs assessment and involvement of individuals at the agency and school level. Even then not all counselors will philosophically accept or be helped through use of a computerized information system. According to Molnar (1976), only 55 percent of secondary schools in the United States had access to computers in 1975 and only 23 percent of the schools were using their computers solely for institutional purposes. This reflects in general current practice, as the advent of micro computers in the marketplace has impacted parents and youth without undue claim or change in the schools.

Secondly, there is a lack of computer literacy. Computer technology has increased geometrically and it is estimated that one million computer systems are in use. Stephenson (1980), in his speech to the Association for Educational Data Systems, reported that there will be an increase in systems and computer affects on one out of two lives on a daily basis. He predicts a rapid increase in computer systems during the 80's, lower costs and more software programs. He feels that computer literacy is limited by institutional responses. The technology is here, there is available

software and additional systems being developed on the area of career guidance. The costs of computers and software is going down and not up. Several of the key questions that we need to address are: How many agencies have counselors and staff people trained in using the computer? How many staff have had courses in their undergraduate or graduate backgrounds in this area? What plans have been prepared to systematically integrate a computer assisted learning and counseling program in schools and agencies?

Thirdly, agencies and institutions need a systematic well developed program of career education. GIS or any computer information system can not be any better than the program at the site. The value depends upon how the system is used.

Fourthly, there needs to be a program established for continued staff development. People need more than just introductory training sessions. They need continuous training and consulting help during the program as well as a change to get together and share ideas with their peers. Value orientations related to technological use in a human service institution will not be imparted after one or two short term training sessions.

RECOMMENDATIONS

The following recommendations are offered to those planning adoption of computer systems:

- *Educational institutions must develop a system to help individuals who become confused by working with GIS or other computer systems. Small group sessions and/or individual counseling may be necessary. Peer groups trained to help students with using the GIS Guide and Summary Sheets may be one way to cut down any anxiety about using the system.
- *The computer system selected and the files in the system need to be evaluated continually for matching the learning program with the available software.
- *Site coordinators and students from participating institutions ought to be utilized in any training sessions held for new sites.
- *The impact that GIS has depends to a large degree, upon the career guidance program at each site. The inclusion of test data from interest, aptitude and achievement testing might help students set more realistic goals and sharpen their search requests. Periodic seminars and in-service session on career guidance should be developed; they are at least as great a need as those on the operation of GIS.
- *The study analyzed short-term impact of GIS and need for a more in-depth study of users over a longer time span is necessary.
- *Computer systems will not receive full utilization unless an intensive network of workshops is delivered to increase computer literacy and awareness among professionals in human service agencies.
- *Human service agencies and public schools must address the philosophical issues related to integrating computer information systems in daily activities if they are to reduce resistance to such integration.
- *Sites wishing to use GIS need to develop a planned program of career education in which GIS is systematically utilized, not just included as a "frill" or an incidental exercise.
- *GIS has potential to be used by subject-area teachers to illustrate the different types of career fields that relate to specialization in that subject area. The system could be used in economics and other social studies areas to study the local job markets and career opportunities.

- *Parent and citizen involvement in local workshops illustrating the value of the GIS system might aid in local funding of computer assisted instruction.
- *Instrumentation for assessing GIS impacts on users must be carefully selected to assure that what is being assessed correlates with what counselors and teachers actually do.
- *Technical assistance to existing and new sites must be improved to assist inexperienced counselors in implementing GIS.

The above recommendations reflect a serious desire on our part to stimulate the development of computer use and application in schools and human service agencies.

In summary, we faced a number of difficulties in conducting this study at the selected sites. The evaluation design we used had specific limitations, particularly in controlling sample selection and erosion. The instrumentation may not have accurately assessed the career counseling processes that accompanies GIS and must be viewed as a limiting factor. The results imply that counselors were not active implementors of career guidance activities, if we were seeking clearly defined adoption strategies for comprehensive career education. Given the overall constraints of assessing multiple impacts upon varying sites and populations, the results are positive. Users and staff reacted positively to GIS and felt that it was helpful in their career planning.

We need to address "our role" in encouraging educators in schools, colleges and human service agencies to adopt computer assisted management and instructional strategies. Staff training,

past and present, appears to be a critical constraint in this process. Statewide forums that address the potential of computer systems, resource needs, access strategies and possible uses need to be conducted on a regular basis. The challenge of change is here, our reactions will be eagerly awaited by members of the business, political and labor sectors in the United States.

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